AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application;

Claim 1. (Currently Amended) A switching power circuit comprising:

a switching unit provided with a plurality of switching devices and performing switching by turning ON and OFF a DC input voltage inputted thereto;

a primary-side drive unit for performing switching driving so that said plurality of switching devices are alternately turned ON and OFF;

an insulated converter transformer for transmitting a switching output fed from said switching unit from the primary side to the secondary side thereof, said insulated converter transformer including a primary winding, and a secondary winding having a center-tapped tap output, with a gap length set to be not less than a predetermined value to thereby set the coupling coefficient of said primary winding and said secondary winding to be not more than a predetermined value;

a primary-side resonance capacitor for forming a primary-side resonance circuit for causing the operation of

said switching unit to be of a resonance type, at least by the leakage inductance component of said primary winding of said insulated converter transformer and ~~its own~~ the capacitance thereof; and

a synchronous rectification circuit having a secondary-side smoothing capacitor connected to the tap output of said secondary winding~~,~~ for obtaining a secondary-side DC output voltage as an end-to-end voltage of said secondary-side smoothing capacitor by performing full-wave rectification of an alternating voltage induced in said secondary winding of said insulated converter transformer and charging said secondary-side smoothing capacitor with the rectified current~~,~~, wherein

~~the~~ numbers of turns of said primary winding and said secondary winding are so set that a secondary-side rectified current caused to flow in said synchronous rectification circuit by said full-wave rectification is in a continuous mode, irrespective of variations in the conditions of a load connected to said secondary-side DC output voltage~~,~~, and wherein

said synchronous rectification circuit comprises:

a first field effect transistor connected in series to

a point between one of end portions divided by the tap output of said secondary winding and a secondary-side reference potential;

a second field effect transistor connected in series to a point between the other of said end portions divided by the tap output of said secondary winding and said secondary-side reference potential;

a first drive circuit for outputting a gate voltage for turning ON said first field effect transistor by detecting, through a resistance device, a secondary winding voltage corresponding to the period of a half wave in which said first field effect transistor should flow a rectified current;

a second drive circuit for outputting a gate voltage for turning ON said second field effect transistor by detecting, through a resistance device, a secondary winding voltage corresponding to the period of a half wave in which said second field effect transistor should flow a rectified current; and~~, further,~~

a first inductor device having a ~~required~~ predetermined inductance inserted in series respectively between said one of said end portions divided by the tap

output of said secondary winding and said first field effect transistor and between said other of said end portions divided by the tap output of said secondary winding and said secondary field effect transistor.

Claim 2. (Currently Amended) The switching power circuit as set forth in claim 1, further comprising a second inductor device inserted in series between the tap output of said secondary winding and said smoothing capacitor.

Claim 3. (Currently Amended) The switching power circuit as set forth in claim 1, wherein said first inductor device is comprised of a tubular magnetic body through which ~~to pass~~ passes a lead wire for a drain electrode of said first or second field effect transistor.

Claim 4. (Currently Amended) The switching power circuit as set forth in claim 1, wherein said first inductor device is formed by making ~~spiral~~ a spiral wiring pattern ~~in~~ on a printed wiring board.

Claim 5. (Currently Amended) A switching power circuit

comprising:

a switching unit provided with a plurality of switching devices and performing switching by turning ON and OFF a DC input voltage inputted thereto;

a primary-side drive unit for performing switching driving so that said plurality of switching devices are alternately turned ON and OFF;

an insulated converter transformer for transmitting a switching output fed from said switching unit from the primary side to the secondary side, said insulated converter transformer including a primary winding~~,~~ and a secondary winding having a center-tapped tap output, with a gap length set to be not less than a predetermined value to thereby set the coupling coefficient of said primary winding and said secondary winding to be not more than a predetermined value;

a primary-side resonance capacitor for forming a primary-side resonance circuit for causing ~~the~~ operation of said switching unit to be of a resonance type, at least by ~~the~~ a leakage inductance component of said primary winding of said insulated converter transformer and ~~its own~~ a capacitance thereof; and

a synchronous rectification circuit having a

secondary-side smoothing capacitor connected to the tap output of said secondary winding~~,~~ for obtaining a secondary-side DC output voltage as an end-to-end voltage of said secondary-side smoothing capacitor by performing full-wave rectification of an alternating voltage induced in said secondary winding of said insulated converter transformer to produce a rectified current and charging said secondary-side smoothing capacitor with the rectified current~~,~~ wherein

~~the~~ numbers of turns of said primary winding and said secondary winding are so set that a secondary-side rectified current caused to flow in said synchronous rectification circuit by said full-wave rectification is in a continuous mode, irrespective of variations in ~~the~~ conditions of a load connected to said secondary-side DC output voltage~~,~~, and wherein

said synchronous rectification circuit comprises:

a first field effect transistor connected in series to a point between one of end portions divided by the tap output of said secondary winding and a secondary-side reference potential;

a second field effect transistor connected in series to a point between the other of said end portions divided by

the tap output of said secondary winding and said secondary-side reference potential;

a first drive circuit for outputting a gate voltage for turning ON said first field effect transistor by detecting, through a resistance device, a secondary winding voltage corresponding to the period of a half wave in which said first field effect transistor should flow a rectified current;

a second drive circuit for outputting a gate voltage for turning ON said second field effect transistor by detecting, through a resistance device, a secondary winding voltage corresponding to the period of a half wave in which said second field effect transistor should flow a rectified current; and~~, further,~~

an inductor device having a ~~required~~ predetermined inductance inserted in series between ~~a~~ the tap output of said secondary winding unit and said smoothing capacitor.

Claim 6. (Currently Amended) The switching power circuit as set forth in claim 5, further comprising a constant-voltage control unit for performing a constant-voltage control of said secondary-side DC output voltage by a

variable control of ~~the~~ a switching frequency of said switching unit according to ~~the~~ a level of said secondary-side DC output voltage.

Claim 7. (Currently Amended) The switching power circuit as set forth in claim 1 or claim 5, further comprising a primary-side partial voltage resonance circuit composed of ~~the~~ a capacitance of a partial resonance capacitor connected in parallel to at least one switching device of said plurality of switching devices constituting said switching unit, and ~~the~~ a leakage inductance component of said primary winding of said insulated converter transformer, said primary-side partial voltage resonance circuit performing a partial voltage resonance operation in ~~the~~ a period for at least which said one switching device is turned OFF.

Claim 8. (Currently Amended) The switching power circuit as set forth in claim 5, wherein said inductor device is a choke coil ~~which is~~ comprised of a flat plate-like ferrite core having a winding longitudinally wound into a hollow cylindrical form by use of a rectangular wire, and a pot-type metallic dust inserted in said hollow cylindrical

winding, and which has a ~~required~~ predetermined saturation magnetic flux density and a ~~required~~ predetermined inductance.

Claim 9. (Currently Amended) The switching power circuit as set forth in claim 5, wherein said inductor device ~~is~~ comprises a choke coil ~~which comprises a required~~ having a predetermined number of turns of a winding on a magnetic leg of an ~~EE type~~ E-shaped core formed of an Mn-Zn based ferrite and which has a ~~required~~ predetermined saturation magnetic flux density and a ~~required~~ predetermined inductance.

Claim 10. (Original) The switching power circuit as set forth in claim 9, wherein said winding of said choke coil is formed by winding a litz wire band formed by aligning a plurality of litz wires in parallel to each other into a band form.

Claim 11. (Original) The switching power circuit as set forth in claim 9, wherein said winding of said choke coil is formed by winding a plain weave wire formed by weaving a plurality of litz wires in plain weave.